

CLAIMS

What Is Claimed Is:

- 1 1. A navigation device comprising:
2 an electronic compass to detect an orientation and provide a corresponding heading
3 signal;
4 one or more motion sensing devices to detect motion along different axis and provide
5 corresponding motion signals; and
6 a processing unit communicatively coupled to the electronic compass and one or more
7 motion sensing devices to received the heading signal and one or more motion signals, determine
8 a position and orientation, and automatically provide different navigation information depending
9 on the orientation of the navigation device.
- 1 2. The navigation device of claim 1 wherein the processing unit is further configured to
2 provide different navigation information depending on whether the navigation device is affixed
3 to a user or not.
- 1 3. The navigation device of claim 2 further comprising:
2 a visible indicator to provide navigation information to a user; and
3 a holster to affix the navigation device to a user..
- 1 4. The navigation device of claim 1 wherein the navigation device automatically switches
2 between different modes of operation depending on the orientation of the navigation device,
3 and provide either heading or position information, depending on the mode of operation.
- 1 5. The navigation device of claim 1 wherein
2 if the navigation device is affixed to a user and the device is in a primary orientation,
3 navigation calculations are made according to bipedal ambulation to provide a position,
4 if the navigation device is affixed to a user and the device is in a secondary orientation,
5 then navigation calculations are made according to crawling ambulation to provide a position,
6 and

- 7 if the navigation device is hand-held, only azimuth data is provided to the user.
- 1 6. The navigation device of claim 1 further comprising:
2 a communication port to transmit navigation information.
- 1 7. A method of navigation comprising:
2 determining whether a navigation device is affixed to a user;
3 obtaining an azimuth heading;
4 calculating a dead reckoning position if the navigation device is affixed to the user;
5 providing azimuth heading and dead reckoning position if the navigation device is affixed
6 to the user; and
7 providing azimuth heading otherwise.
- 1 8. The method of claim 7 further comprising:
2 determining an orientation of the navigation device relative to a horizontal plane;
3 calculating the dead reckoning position according to bipedal ambulation when the
4 navigation device is affixed to the user and is in a first orientation; and
5 calculation the dead reckoning position according to crawling ambulation when the
6 navigation device is affixed to the user and is in a second orientation.
- 1 9. A method comprising:
2 determining the orientation of a navigation device;
3 automatically selecting a first motion measurement algorithm if the navigation device is
4 in a first orientation;
5 automatically selecting a second motion measurement algorithm if the navigation device
6 is in a second orientation; and
7 providing a position according to the pedometry algorithm selected.
- 1 10. The method of claim 9 wherein the orientation of the navigation device is determined
2 relative to a horizontal plane.
- 1 11. The method of claim 9 further comprising:

2 determining if the navigation device is affixed to a user;
3 automatically selecting the first motion measurement algorithm if the navigation device is
4 in the first orientation and affixed to the user;
5 automatically selecting the second motion measurement algorithm if the navigation
6 device is in the second orientation and affixed to the user; and
7 suspending all motion measurement calculations if the navigation device is not affixed to
8 the user.

1 12. A machine-readable medium having one or more instructions for dead reckoning
2 navigation, which when executed by a processor, causes the processor to perform operations
3 comprising
4 determining whether a navigation device is affixed to a user;
5 obtaining an azimuth heading;
6 calculating a dead reckoning position if the navigation device is affixed to the user;
7 outputting the azimuth heading and dead reckoning position if the navigation device is
8 affixed to the user; and
9 outputting the azimuth heading otherwise.

1 13. The machine-readable medium of claim 12 to further:
2 determining an orientation of the navigation device relative to a horizontal plane,
3 calculating the dead reckoning position according to bipedal ambulation when the
4 navigation device is affixed to the user and is in a first orientation, and
5 calculation the dead reckoning position according to crawling ambulation when the
6 navigation device is affixed to the user and is in a second orientation.